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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,861	10/29/2003	Matthew J. Holcomb	004309.P023	9747
8791	7590	08/09/2006	EXAMINER	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			VIJAYAKUMAR, KALLAMBELLA M	
			ART UNIT	PAPER NUMBER
			1751	

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/697,861	Applicant(s) HOLCOMB, MATTHEW J.	
	Examiner Kallambella Vijayakumar	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1, 4 and 5 were amended. Claims 7-24 were newly added. Claims 1-24 are currently pending with the application.

Applicant's arguments, filed 05/19/2006, with respect to the claims have been fully considered and persuasive to overcome the rejection of claims over the reference by Seeber et al (US 5,314,714. However, Applicant's arguments that the reference by Dunand et al (US 6,630,427) does not teach using at least 20% by volume of Ga and/or the superconducting through proximity effect is not persuasive (Response, Pg10, Line-16 to Pg-11, Line-2), because the prior art clearly teaches the addition of 10-80 vol% matrix material and the proximity effect (Col-16, Ln 62-64; C-19, Ln 55-59). The crux of the applicant's invention is the volume fraction of the matrix material in relation to the superconductor particles in the composition. The prior art by Dunand et al clearly teaches this volume fraction.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "highest" in claims 1 and 4 is a relative term which renders the claim indefinite. The term "highest" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The examiner construes Gallium or its alloys to meet this limitation in the claims for the purposes of the examination.

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Claim Rejections - 35 USC § 102

Claim Rejections - 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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1. Claims 1-5, 13-17, 19-21 and 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by, or under 35 U.S.C. 103(a) over Dunand (US 6,630,427).

Dunand teaches a MgB₂ superconductor/metal matrix composite with improved performance containing MgB₂ superconductor that has been infiltrated with a liquid/melted metallic material component such as Ga or its alloys. The amount of the superconductive volume ranged between 20-90 vol% that translates to a matrix volume of 80-10 vol% (Abstract, Col-5, Ln 5, Col-5, Ln 25-26, 53-54; Col-8, Ln 38-58; Col-11, Example-2). The composition of the art composite and ratio between MgB₂ and the metallic phase in the composite are identical to that by the applicants (Spec: US 2004/0192558; Para 0176) and the claimed proximity of the particles and their functionality in the claims and the highest lambda values in claims 1 and 4 will be anticipated, because identical compositions have identical characteristics and properties. MgB₂ composite with a T_c of about 39K meets the limitation of an operating temperature of at least 20K on claims 19 and 22.

With regard to the method claims 4-5, 16-17, and 22-23 the prior art teaches mixing the MgB₂ and the metal matrix powders in the proportions identical to that by the applicants and forming the composite (Col-11, Example-2). All the limitations of the instant claims are met.

The reference is anticipatory.

In the alternative that the disclosure be insufficient to arrive at the limitations of the instant claims by the applicants, it would have been obvious to a person of ordinary skilled in the art to optimize the volume fractions of the components to optimize the particle distribution of the superconductive particle with reasonable expectation of success to benefit from improved critical temperature, current and magnetic properties, because the prior art is suggestive of such modifications (C-5, Ln 17-40).

2. Claims 6, 18 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunand (US 6,630,427).

The disclosure on the composition and making of the MgB₂ superconductor/metal matrix composite as set in rejection-1 under 35 USC 102(e)/103(a) are herein incorporated.

The prior art fails to teach forming a wire from the superconductor/metal composite per the claims.

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However, the prior art teaches an elongated member/cylinder of superconductor/metal composite (Col-18, Ln 44-45) with improved predetermined configuration and performance of superconductor properties (Col-5, Ln 41-42 and 51-54), and further discloses the prior art interest in MgB₂ wires/tapes with high critical density (Page-2, references, particularly by Wang et al). It would be obvious to a person of ordinary skill in the art to fabricate/draw a wire from the MgB₂ cylinder of Dunand with reasonable expectation of success, because drawing superconductor wires from billets was a well known process in the art at the time of the disclosure of the invention by the applicants (Seeber et al; US 5,314,714; Col-2, Ln 36-41).

3. Claims 7-11 are rejected under 35 U.S.C. 102(e) as being unpatentable over Dunand (US 6,630,427) in view of Ottavia et al (Physical Review, 1994, 49(17), PP 11479-11758).

Normally, only one reference should be used in making a rejection under 35 U.S.C. 102. However, a 35 U.S.C. 102 rejection over multiple references has been held to be proper when the extra references are cited to (MPEP 2131.01)::

- (A) Prove the primary reference contains an "enabled disclosure;"
- (B) Explain the meaning of a term used in the primary reference; or
- (C) Show that a characteristic not disclosed in the reference is inherent.

The disclosure on the composition and making of the MgB₂ superconductor/metal matrix composite as set in rejection-1 under 35 USC 102(e) are herein incorporated.

The presence of amorphous Ga in the functional prior art superconductor composite would be anticipated over the disclosure of the Ottavia et al that show non-crystallization of supercooled liquid Ga down to 34K, and further meets the limitation of the composition and method steps in the claims.

The reference is anticipatory.

4. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunand (US 6,630,427) in view of Ottavia et al (Physical Review, 1994, 49(17), PP 11479-11758) and Teske et al (J. Phys. Condens. Mater 1999, 11, PP 4935-4940).

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The disclosure on the composition and making of the MgB₂ superconductor/metal matrix composite as set in rejection-1 under 35 USC 102(e)/103(a) and as set in rejection-2 under 35 USC 103(a) are herein incorporated.

The prior art is silent about the amorphous nature of Ga in the composition.

In the analogous art, Teske et al teach the structural and superconductor properties Ga, the amorphous Ga having the highest superconducting transition temperature (Pg-4936, Table-1).

It would have been obvious to a person of ordinary skilled in the art to combine the prior art teachings to substitute the Ga in the composition of Dunand et al with amorphous Ga of Teske et al as functional equivalents to benefit from improved critical temperature of the composite with reasonable expectation of success, because prior art is concerned about it (C-5, Ln 17-40).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMV
July 27, 2006.


DOUGLAS MCGINTY
SUPERVISORY PATENT EXAMINER

1751

++++++ Gallium (Ga) ++++++

Atomic Number: = 31

Atomic Weight: = 69.72

Oxidation States: = +3

Density, g/cm³, 20 C: = 5.903

Melting Point, C: = 29.78

Boiling Point, C: = 1980

Gallium (Ga) derives its name from the Latin 'Gallia', meaning France. It was discovered and isolated by Lecoq de Boisbaudran in 1875. Gallium occurs in trace amounts in numerous minerals and in coal.

Gallium is one of the few metals that can be liquid near room temperature. It has the longest liquid range of all the metals. It has a very low vapor pressure, even at very high temperatures.

Pure gallium is a silvery metal with a high luster and has the ability to wet glass surfaces. For these reasons it is used to produce high quality mirrors. It also has an important use in doping semiconductor materials in the manufacture of transistors and other solid state devices. One of its compounds, gallium arsenide, is capable of converting sunlight directly into electricity.